offices, as all messages of the most private nature can be sent without publicity, an advantage possessed by no other system.

It is unnecessary to point out any other of the many practical applications to which this auto-kinetic system may be applied. It is a system that must shortly extend its social metallic nerves to all the large centres of commerce and manufacture in this kingdom, and its various applications will then become more fully developed and known.

THE RAIN-TREE OF MOYOBAMBA

SOME little while since a paragraph went the round of the papers, describing, on the authority of the United States Consul in the province of Loreto, a tree existing in the forests near Moyobamba, in Northern Peru.

According to the *Madras Times* and *Overland Mail* of December 15, 1877, "The tree is stated to absorb and condense the humidity of the atmosphere with astonishing energy, and it is said that the water may frequently be seen to ooze from the trunk, and fall in rain from its branches in such quantity that the ground beneath is converted into a perfect swamp. The tree is said to possess this property in the highest degree during the summer season principally, when the rivers are low and water is scarce, and the Consul therefore suggests that the tree should be planted in the arid regions of Peru, for the benefit of the farmers there."

As always happens in cases of this kind, there have not been wanting those who have taken this singular story quite seriously, and the India Office has applied to the Royal Gardens, Kew, on behalf of the Agri-Horticultural Society of Madras for information about the tree. It may be interesting to some of the readers of NATURE, and it will certainly save future correspondence, if I explain once for all what I have been able to ascertain as to the origin of the fable and the amount of truth which it contains.

Pœppig's "Reise in Chile und Peru" (2 vols., 1835), which contains much useful botanical information, apparently makes no reference to the subject.

I am indebted to Dr. Francis Darwin for pointing out to me a very similar account which appears in the *Botanische Zeitung*, January 21, 1876, pp. 35, 36, in which Prof. Ernst, of the University of Caracas, records his observations upon a tree of *Pithecolobium* (*Calliandra*) *Saman*, Benth.

"In the month of April the young leaves are still delicate and transparent. During the whole day a fine spray of rain is to be noticed under the tree, even in the driest air, so that the strongly-tinted iron-clay soil is distinctly moist. The phenomenon diminishes with the development of the leaves, and ceases when they are fully grown."

I found that the specimens of this tree in the Kew Herbarium brought its range close to Moyobamba, as they included some gathered by the traveller Spruce, near the neighbouring town of Tarapoto. It appeared probable, therefore, that the Tamia-caspi—the name given in one variant of the story—was *Pithecolobium Saman*, though the cause of the rain was more mysterious than ever. Being vouched for by so competent an observer as Prof. Ernst, its occurrence could not well be denied, while on the other hand, the *Pithecolobium* being a well-known cultivated tree in the West Indian Islands, it was quite clear that if the "raining" from its foliage were a normal occurrence, it would long ago have been put on record.

Mr. Spruce has, however, obligingly supplied me from the astonishing stores of information which he possesses with the true history of the whole matter, and he has also been so good as to allow me to communicate to the readers of NATURE the substance of what he has told me.

"The Tamia-caspi, or rain tree of the Eastern Peruvian Andes, is not a myth, but a fact, although not exactly in the way popular rumour has lately presented it. I did not know there was any doubt as to the true origin of the 'rain.' I first witnessed the phenomenon in September, 1855, when residing at Tarapoto (lat. 6½° S., long. 76° 20′, W.), a town or large village a few days eastward of Moyobamba, and little more than 1,000 feet above the sea-level. I had gone one morning at daybreak, with two assistants, into the adjacent wooded hills to botanise. . . . . A little after seven o'clock, we came under a lowish spreading tree, from which with a perfectly clear sky overhead a smart rain was falling. A glance upwards showed a multitude of cicadas sucking the juices of the tender young branches and leaves, and squirting forth slender streams of limpid fluid. We had barely time to note this when we were assailed by swarms of large black ants, which bit and stung fiercely, and obliged us to beat a retreat, my companions calling out as they ran 'Tamia-Caspi! Tamia-Caspi!' When we had shaken off our assailants, I ventured to approach the spot so near as to make out that the ants were greedily licking up the fluid as it fell. . . .

"My two Peruvians were already familiar with the phenomenon, and they knew very well that almost any tree, when in a state to afford food to the nearly omnivorous cicada, might become (*pro tem.*) a Tamia-caspi, or rain-tree. This particular tree was evidently, from its foliage, an *Acacia*, but as I never saw it in flower or fruit, I cannot say of what species. I came on cicadas, similarly occupied, a few times afterwards, and on trees of very different kinds, but never without the pugnacious ants on the ground beneath. Among the trees on which I have seen cicadas feed, is one closely allied to the acacias, the beautiful *Pithecolobium Saman*. The young branches are very succulent, and they bear elegant bipinnate leaves. . . . The pods are greedily eaten by deer and cattle. Another leguminous tree visited by cicadas is *Andira inermis*, and there are many more of the same and other families which I cannot specify. Perhaps they avoid only such as have poisonous or strongly resinous juices; and those which are permanently tenanted by ferocious ants such as all *Polygoneæ*, the leguminous *Platymiscium*, and a few others. . . . These ants rarely leave the tree which affords them food and shelter, and they jealously repel all intruders, the slightest scratch on the smooth bark sufficing to call their sentinels to the spot. They are quite distinct from the robust marauding ants that drink the cicadas' ejectamenta.

"I have no doubt you have above the true explanation of the Tamia-caspi, or rain-tree. As to the drip from a tree causing a little bog to form underneath and around it, that is a very common circumstance in various parts of the Amazon Valley, in flats and hollows, wherever there is a thin covering of humus, or a non-absorbent sub-soil, and the crown of foliage is so dense as to greatly impede evaporation beneath it. On such sites the Achuál palm (*Mauritia flexuosa*) common enough between Moyobamba and Tarapoto, as well as on the savannahs of the Orinoco, and in subriparial forests of the Amazons—affords a striking example of this property, as has already been remarked by Gumilla, Velasco, Humboldt, and others. Finally, although I never heard the name Tamia-Caspi applied to any particular kind of tree, during a residence of two years in the region where it is now said to be a speciality, it is quite possible that in the space of twenty-one years that have elapsed since I left Eastern Peru, that name may have been given to some tree with a greater drip than ordinary; but I expect the cicada will still be found responsible for 'the moisture pouring from the leaves and branches in an abundant shower'—the same as it was in my time."

Mr. Spruce's notes are so precise and careful that there is little difficulty in accepting his explanation of the rain-tree. It is, however, hard to understand the omission of all insect agency in the equally careful account given by

Prof. Ernst, who attributes the "rain" to secretion from glands on the footstalk of the leaf on which drops of liquid are found, which are rapidly renewed on being removed with blotting paper. It is curious that precisely the same question has been the subject of controversy in the Old World with respect to honey-dew. It is generally believed that this is the result of the aggregate ejecta of Aphides feeding on the juices of the lime. So competent an observer, however, as Boussingault was of opinion that honey-dew was a spontaneous exudation, and it seems not impossible that the lime, as well as the *Pithecolobium Saman* may, under some abnormal circumstances, exude a sugary secretion which insects would eagerly feed on.[1]

W. T. THISELTON DYER

NOTES

WE have to record still another great loss to science in the death on Tuesday, at Rome, of Father Secchi, the eminent astronomer, whose serious illness we recently recorded. We can do no more at present but announce the sad event.

ABOUT 355*l.* have been subscribed to the Darwin Memorial Fund, the idea of which, our readers may remember, originated at Cambridge on the occasion of conferring the degree of LL.D. on Mr. Darwin. We would again draw the attention of our readers to the fund; many of them, we are sure, will be glad to contribute to it, and those who desire to do so should lose no time in sending their subscriptions to the treasurer and secretary, Mr. A. G. Dew-Smith, Trinity College, Cambridge.

A COMMITTEE of members of the several classes of the French Institute, together with a number of eminent scientific men, has been formed to promote the erection of a monument to Leverrier in the grounds of the Paris Observatory. It is expected that foreigners as well as Frenchmen will subscribe.

PROF. FLOWER'S Hunterian Lectures at the Royal College of Surgeons this year will treat of the Comparative Anatomy of Man, more particularly of the Osteological and other Physical Peculiarities of the Races of Australia and the Pacific Ocean. The first two lectures will be devoted to an exposition of the principal methods of craniological research, exemplified by a series of fifty Australian and as many European skulls. The account of the structure of each race will be preceded by a notice of the principal facts of its history and social condition. The lectures commence on Monday next at 4 o'clock, and will be continued at the same hour on Mondays, Wednesdays, and Fridays, till March 28. Any one interested in the subject is admitted.

THE Philosophic Faculty of the University of Zurich has just conferred the degree of Doctor Philos. *honoris causa* on Mr. J. J. Wild, formerly of the scientific staff of H.M.S. *Challenger*, and author of the recent work, "Thalassa," embodying some of the results of that expedition.

THE Photographic Society have awarded to Capt. Abney a silver Progress Medal for having made the greatest advance in the science of photography during the past year.

THE third general meeting of Polish naturalists and physicians will take place at Cracow this year. The two former meetings were held at Posen and Lemberg respectively.

THE Committee of the French Association for the Advancement of Science held a meeting last Thursday. The 16th of August was appointed for the opening of the session, which will be presided over by M. Fremy. The general and sectional meetings will take place at the Hôtel des Beaux Arts, Paris, which contains an immense number of rooms tastefully decorated with fine pictures. The Committee has distributed 8,850 francs among a number of inventors who are constructing machines or scientific apparatus for exhibition. A number of other *encouragements* for similar purposes will be distributed; among the scientific men who will be assisted we are in a position to mention the name of M. Mouchot, for establishing on a large scale his celebrated solar steam-engine.

THE annual session of the Deutsche anthropologische Gesellschaft for 1878 begins at Hamburg on August 11. The meetings on the 12th, 13th and 14th take place at Kiel, and those on the 15th and 16th at Lübeck.

IN the January session of the Berlin anthropologische Gesellschaft, Prof. G. Fritsch delivered an exhaustive address on the subject of Bushman drawings, in which he compared his own observations in the Cape Colony with the late discoveries of Rev. C. G. Büttner in the neighbourhood of Ameib, in the Damara region. These combined results show the widely extended presence of these drawings in South Africa and the existence of a surprising familiarity with perspective and the principles of grouping. In view of the fact that the Bushmen are probably the most degraded race of mankind now existing, dwelling as they do in caves and living from hand to mouth, these evidences of the first principles of art among them possess no small degree of value as explanatory of numerous attempts at illustration before the stone and bronze ages. This is especially the case with the cave dwellers of the so-called reindeer epoch, whose remains have been uncovered recently in France and Switzerland. Anthropologists have had frequent discussions during the past year with regard to the origin of the sketches of animals in the cave of Thainingen, supposed to date back to this epoch; and the opinion has been stoutly maintained that the human race at this stage of development was utterly unable to produce works of this kind. This view will scarcely be tenable in light of these late discoveries among the Bushmen, who are certainly not advanced beyond the stone-age.

IT is expected that the British Archæological Association will hold its annual congress next summer at Wisbeach, to which it has been courteously invited by the Mayor and Corporation. If this arrangement should be definitely made the Prince of Wales will be asked to allow his name to be used as the patron of the congress.

THE Russian division in the Paris Exposition will contain a most interesting anthropological collection, the material for which is now being gathered by a Commission in Moscow. Among the more prominent features are an enormous cranial collection from the various parts of the empire, and a model of a Russian barrow. The latter is being executed by the sculptor, Ssewojugin, in natural size, and will offer a perfect imitation of the skeletons, ornaments, weapons, &c., as usually found in these ancient remains. The Russian educational system will be likewise very fully represented, as was the case in 1876.

THE official report of the Munich Session of the German Scientific Association, which took place last September, has just appeared. It forms a volume of 264 quarto pages, and has been prepared with unusual care. Reports of all addresses delivered have been furnished by the speakers themselves, who numbered considerably over a hundred. The number of members and participants in the last session was 1,800, of whom 650 were from Munich or its vicinity. We notice that the Society is exceedingly strict in the observance of one of its statutes stating that it shall possess no property with the exception of its archives, for the receipts exactly cover the expenses.

THE death is announced of Major-General Sir Andrew Scott Waugh, F.R.S., of the Royal Engineers, at the age of sixty-eight. He entered the Bengal Engineers in 1827, and assisted in the making of the great Trigonometrical Survey of India in 1832. He also took a leading part under Sir George Everest

[1] I have translated Boussingault's paper, and collected the evidence on both sides, in the *Journal* of the Royal Horticultural Society, new series, vol. iv. pp. 1–7.